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## U. S. DEPARTMENT OF AGRICULTURE.

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FARMERS' BULLETIN 526.

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# MUTTON AND ITS VALUE IN THE DIET.

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## LETTER OF TRANSMITTAL.

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U. S. DEPARTMENT OF AGRICULTURE,  
OFFICE OF EXPERIMENT STATIONS,  
*Washington, D. C., January 23, 1913.*

SIR: In accordance with your suggestion, the accompanying summary of data on the value of mutton in the diet has been prepared to meet the popular requests for such information, which I have the honor to submit and recommend for publication as a Farmers' Bulletin.

For many years the relative value of different kinds and cuts of meat, the effects of methods of cooking upon nutritive value, the ease and thoroughness of digestion of meats, the influence of different methods of preparation upon flavor, palatability, and economy, and related questions have been studied in connection with the nutrition investigations of this office. Information regarding the use of meat in different parts of the country has also been gathered in connection with dietary studies made with individuals and families living under widely varied conditions. Data of this character, and the results of special experiments and tests, have been used in preparing the present bulletin. Recipes collected from many sources have been tested and standardized, and the attempt has been made to present information in a way which will prove useful for the home table.

The production of mutton is an important agricultural industry in the United States, which has been studied at many of the agricultural experiment stations as well as by the Department of Agriculture. While lamb is always appreciated, it would seem that the fine qualities of mutton and the many appetizing ways in which it may be served are not so generally known to housewives. It has been the purpose of this bulletin to supply information of this character which would be useful to the housekeeper.

The bulletin was prepared by C. F. Langworthy, chief of nutrition investigations, and Caroline L. Hunt, expert in nutrition. The latter, who has had wide experience in the study of scientific and practical problems of nutrition, made extensive studies of mutton cookery for this specific purpose.

Acknowledgment should be made to teachers of home economics in agricultural colleges and other educational institutions and to housekeepers and others who have supplied recipes and other data.

Respectfully,

A. C. TRUE,  
*Director.*

HON. JAMES WILSON,  
*Secretary of Agriculture.*

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# MUTTON AND ITS VALUE IN THE DIET.

## INTRODUCTION.

Mutton has from early times been a popular food both in the Orient and among western nations. The ease with which the sheep is raised and the fact that its flesh is not, like some other meats, excluded on religious grounds from the dietary of any large group of people, combine with its palatability to bring it into widespread favor. The terms "lamb" and "mutton" are somewhat loosely used to designate the meat obtained from the younger and older animals. In some localities mutton is used to apply to the flesh of all but young lambs; in others its use is limited to the flesh of full-grown sheep. The latter is perhaps the commonest usage in the United States.

The preference for lamb or for mutton, like the use of the terms, varies with the locality. Of late years a preference for lamb to older mutton has been noticeable, particularly in the United States. In England, on the other hand, mutton has always been more commonly used. The popularity of one or the other will probably always be determined by taste, fashion, or market conditions, for both are palatable and nutritious foods.<sup>1</sup>

The general belief that mutton and lamb are wholesome has been strengthened recently by such work as that of the United States Department of Agriculture, whose reports of meat inspection show that it has been necessary to reject relatively few mutton carcasses as unfit for food, and that the sheep is particularly free from diseases which render meat undesirable.

## COMPOSITION AND NUTRITIVE VALUE.

The term "mutton" is here used to apply to the flesh of a sheep one year or more old. Such meat differs in composition from the flesh of a lamb very much as meat of any other mature animal differs from that of a young animal of the same kind, as beef differs from veal, for example, or fowl from chicken, i. e., it has, in general, a smaller percentage of water and larger percentages of fat, protein, and extractives or flavoring substances. Pound for pound, mutton has a larger amount of tissue-forming substances and a higher energy value than lamb.

So far as nutritive value is concerned, mutton is usually classed with beef. Analyses reported in an earlier bulletin of this series<sup>2</sup> show that they have nearly

<sup>1</sup> The structure, composition, and general qualities of different kinds and cuts of meat are considered in an earlier publication. (U. S. Dept. Agr., Farmers' Bul. 34, Meats: Composition and Cooking.) The value of meat as food, ways of reducing expense in the use of meat, methods of meat cookery, directions for utilizing cheaper cuts of meat in palatable dishes, and other like topics, are discussed in a similar publication. (Farmers' Bul. 391, Economical Use of Meat in the Home.)

<sup>2</sup> U. S. Dept. Agr., Farmers' Bul. 34.

the same composition. The percentage of waste differs very slightly in the two, being on the average a little less than 20 per cent in each. In the edible portion the percentage of protein is practically the same; it averages about 18 per cent in the beef and 16 per cent in the mutton. It is only when the fat is considered that any considerable difference is noted. This averages about 20 per cent of the edible portion in medium fat beef and a little over 30 per cent in the corresponding kind of mutton. As might be expected, water is correspondingly low in the mutton and high in the beef, being about six-tenths, or 60 per cent, of the total in the beef and about five-tenths, or 50 per cent, of the total in the mutton. Because of the larger amount of fat, the fuel or energy value is greater in mutton than in beef, being usually stated as 1,500 calories per pound, while that of beef is given as about 1,145 calories. The fact should be kept in mind, however, that these figures refer to the average of many samples of the two kinds of meat. The variations in different samples of either meat are wider than the differences between these average values, and for this reason the custom of classing beef and mutton together when their nutritive values are concerned may be considered fair.

### DIGESTIBILITY OF MUTTON.

Mutton and lamb are commonly believed to digest readily without causing disturbance, and both experience and the results of scientific investigation seem to bear out this belief. To this may be ascribed the common use of mutton and lamb in invalid dietetics, as well as in the daily fare.

The question of the thoroughness of digestion of meat has been studied in connection with the nutrition investigations of this office,<sup>1</sup> which reported a number of experiments made for the purpose of determining the effect of different methods of cooking upon the ease and thoroughness with which various kinds and cuts of meat are digested. There was nothing in the results of the experiments to indicate that any one variety of meat or any one cut of meat has any very large advantage over others in this respect. Meats as a whole rank as very digestible foods, 97 per cent of the meat protein and 95 per cent of the fat being retained in the body, while 87 per cent of the energy of the meat is available for body uses. The figures for mutton may, however, prove interesting here, though the results differ little from those obtained with other meats. Five cuts of mutton, i. e., the shoulder, flank, leg, loin, and ribs, were all prepared in the same way, that is, by being boiled for three hours in water. In most cases several samples of the same cut were tested. After being cooked the various kinds were digested artificially. The results showed that at the end of one hour 78 per cent on an average of these cuts had been digested. The amount of digested material gradually increased until, at the end of 24 hours, less than 5 per cent of any one remained undigested. In the case of the leg the undigested portion of every sample was less than 2 per cent.

Experiments in natural digestion were also made. The subjects were men in normal health and the experimental ration was a simple mixed diet which included roast mutton. The results showed that over 99 per cent of the protein and over 98 per cent of the fat of the mutton were digested—figures which were practically identical with those obtained with roast beef. In other words, mutton, like beef, was almost completely assimilated.

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<sup>1</sup> U. S. Dept. Agr., Office Expt. Stas. Bul. 193.

**RELATIVE ECONOMY IN THE USE OF MUTTON.**

While mutton and beef do not differ materially in percentage composition or digestibility, mutton has an advantage in that it is capable of somewhat more economical use. The mutton carcass, unlike the beef carcass, is of such size that a quarter or a half, either of which supplies a variety of cuts, can be conveniently utilized in a household of moderate size with ordinary refrigerating facilities, and the price per pound is commonly less when the meat is bought in this way. There is a certain advantage, too, in the fact that the leg, which has the smallest percentage of waste of any of the cuts of mutton, is of suitable size for family use, for a piece of meat which has not been cut up keeps better than one which has been cut. On the other hand, the rather general belief, which, however, seems unfounded, that all kinds of mutton fat are unsuitable for culinary purposes, has tended somewhat to an uneconomical use of this meat. This subject receives further treatment in a later paragraph. (See p. 8.)

**THE FLAVOR OF MUTTON.**

The sex, age, and feeding of the animal are all factors which help to determine the natural flavor of mutton. It is said by experts, too, that dressed mutton is peculiarly liable to absorb odors and to have its own flavor modified by the flavor of other substances with which it comes in contact. For this reason, careful and quick slaughtering and dressing and good facilities for refrigerating are considered even more essential in the satisfactory preparation of mutton for market than in the case of beef or pork. Since methods of feeding are being investigated and standardized, and all the processes of handling and storage are being rapidly perfected, there is reason to look for a continual improvement in the quality of mutton found upon the market and a corresponding increase in its popularity as a food material.

The characteristic flavor and odor of mutton are said to have their origin in the fat. Lewkowitsch, an authority upon the chemistry of fats, quotes an early investigator as ascribing the odor to the presence of "hircinic acid," but this, he states, was later shown to be merely a mixture of well-known volatile fatty acids. If the characteristic mutton flavor is due to volatile fatty acids, we can understand why it is lessened by cooking with water, since such acids are volatile in steam. Cooking the fat with a little vinegar or stronger acids seems to lessen the characteristic flavor somewhat, though perhaps the effect is only to mask the mutton flavor by that of the acid. If a little vinegar or lemon juice is placed in the water in which mutton is boiled or stewed, a flavor is obtained which is different from mutton cooked without the acid, and by many considered very agreeable.

In some countries it is the custom to prepare mutton by soaking it in highly spiced vinegar and water for a day or longer, and then to roast or boil it, and serve it with a sour sauce made usually with sour cream. (See p. 23.) As vinegar is a preservative, we may imagine that this method, like that of corn-ing meat, was first employed as a means of preservation. For such a reason, we, with our improved refrigerating processes, would seldom need to make use of it. The fact should not be overlooked, however, that during the time when this mode of preparation was frequently necessary, the dish was perfected and made appetizing. Besides being of historical interest, therefore, it may have a practical value, and those who have limited facilities for keep-



ing food, or who for any reason seek variety in their diet, may be glad to know of it.

Whatever the reason, the habit of using acids or acid fruits and vegetables in the preparation of mutton seems to be very widespread, particularly in foreign countries or where foreign methods prevail. Creole cookbooks recommend that, in addition to the sour sauce which almost invariably accompanies the meat, a few drops of lemon juice be added to each slice of boiled mutton before it is served. In Turkey, a favorite dish is prepared by cooking chopped mutton and rice in grape leaves which are slightly acid. In some countries, quinces or sour apples are cooked with mutton. In the United States, the addition of currant jelly to the gravy of roast mutton is very common, and capers or the liquor in which they have been bottled, chopped pickles, vinegar, lemon juice, and tomato juice are often used for the same purpose. Sour apples cooked under roast mutton have been found to impart an agreeable flavor to the gravy.

### THE FAT OF MUTTON AND ITS CHARACTERISTICS.

Fats from various sources, animal and vegetable, differ in hardness and in their melting and solidifying points, as well as in other physical characteristics. The melting point of mutton tallow, for example, is usually given as between 111° and 122° F.; while that of the corresponding beef fat, usually known as beef suet or beef tallow, is given as between 107° and 120° F.; and the corresponding pork fat as between 97° and 115° F. Not only do fats from different animals and plants differ in these particulars, but fats from different parts of the same animal differ also. In this laboratory, the melting point of a sample of mutton kidney fat was found to be 122° F.; that of fat from the "covering" of the leg, 114° F.; that of fat from the lean portion of the leg, which was obtained by boiling the meat and allowing the fat to rise, 105° F.; and that of a mixture of fat from the "covering" of the leg and from the interior of the lean portion of it, which was obtained from the liquid in which a leg of mutton was boiled, 107° F. It is evident from these figures that fats taken from different parts of the mutton carcass can not be classed indiscriminately when their uses and the precautions necessary in handling them are under consideration, any more than fats from different animals can be so classed. Therefore the statement frequently made in books on cookery, that fat which "tries out" from mutton is too hard to be useful for any purpose except soap making, obviously needs qualification. As a matter of fact, the fat from the leg was found in this laboratory to be suitable for many culinary purposes. It was used satisfactorily for sautéing (frying in a small amount of fat) and also in the preparation of vegetables. Since this fat would seldom be available in large quantities in the household, it was not thought necessary to experiment with it for deep fat frying.

A hard fat is very much softened if a little soft fat is mixed with it. Since the kidney fat is too hard for ordinary culinary purposes, experiments were made in mixing it with other softer fats. For this purpose, vegetable oils were used and also lard and beef fat. When economy, as well as flavor, is taken into consideration, the best results may be said to have been obtained from the mixture of two parts of mutton suet with one of lard. This mixture has a melting point appreciably lower than that of the mutton suet alone, and it was used satisfactorily for deep fat frying, for "shortening" foods with distinctive

flavor, and for many other purposes. It gave fair results even in the preparation of baking-powder biscuits.

#### The Flavor of Mutton Fat—Savory Fat.

In the preceding pages, only the question of the hardness of mutton fats as related to their culinary uses has been considered. Objection is, however, sometimes made to the use of this fat for such purposes because of its peculiar or, as it is often described, its "muttony" flavor, which many persons do not like, though others consider it palatable. The possible nature of the flavoring substance has been spoken of elsewhere. (See p. 7.) It would make for economy if mutton fat were more commonly used in the kitchen. For this reason, tests were made of different ways of modifying the flavor so that the mutton fat might be more generally used in cooking. The most satisfactory method found was to mix some leaf lard with the suet and render with milk. The suet and leaf lard mixture was finely divided by passing it through a meat grinder, and was heated in a double boiler with about one-half of its weight of whole milk. The fat was quickly released from the tissues, and, when allowed to cool, formed a cake on the surface of the liquid, which was easily removed. Mutton suet and leaf lard, fresh and of good quality, "tried out" in this way, possessed little, if any, of the characteristic mutton odor and flavor. The best results were obtained with a mixture of two parts of mutton suet and one of leaf lard, finely ground, rendered with whole milk in proportion of  $\frac{1}{2}$  pint to 2 pounds of the mixed mutton and lard. This fat had an exceptionally good odor and flavor, which it retained when kept for weeks in an ordinary refrigerator. It was also of good color and texture, being softer than the mutton fat alone, owing to the milk fat and lard which it contained. If such fats are rendered in an open kettle, a moderate heat is desirable, since they "burn on" very readily. Rendering in a double boiler is much more convenient. In numerous tests, such fat proved satisfactory either alone or with a little butter for use in cooking vegetables and for other purposes.

Another way of utilizing mutton fat for frying and other culinary purposes, is in the form of savory fat, similar to that made from beef drippings and other fats. Such savory fat may be easily prepared. For each pound of the carefully rendered mutton fat, allow an onion, a sour apple, and a teaspoon of ground thyme or mixed herbs tied up in a small piece of cloth. Cook these in the fat, at a low temperature in the oven or on top of the stove, until the onion and apple are thoroughly browned. Then strain off the fat, which will be found well seasoned and may be used in place of butter or other savory fat for seasoning or for warming of potatoes, cooking vegetables, and in other ways. Winter or Hubbard squash cooked in the mutton fat until it is brown was also found in this laboratory to impart a savory flavor. The savoriness produced by the use of fruits and vegetables in this way seems to be due to the solution in the fat of specific flavoring bodies present in the fruits, vegetables, or herbs, and to the fat taking up some of the caramelized carbohydrate formed when the fruit or vegetable browns.

The fat which may be removed from mutton broth or soup is useful in many similar ways in cookery, as it has taken up flavor from the vegetables of the soup. After the soup has cooled, remove the fat, melt it, and strain through a cloth. Some of the ways of using savory fat are noted elsewhere in this bulletin. (See p. 18.)

### The Solidifying Points of Mutton Fats.

Fats which have high melting points have also high solidifying points, and those which have low melting points have low solidifying points. Fats which harden at about blood heat are not commonly liked for culinary and table purposes, as they harden when eaten and make the lips and mouth feel "furry." This should be kept in mind, particularly in the serving of mutton. In this laboratory, it was found that mutton tallow, which melted at 122° F., could be cooled down to 93° F. before it again became solid, that is, to several degrees below body temperature (98.4° F.); that fat from the "covering" of the leg, which had a melting point of 114° F., had a solidifying point of 89° F.; that fat from the lean portion of the leg, which had a melting point of 105° F., had a solidifying point of 77° F.; and that a mixture of fats from the covering and the lean portion of the leg melted at 107° F. and solidified at 82° F. The difference between the solidifying points of the various fats explains the fact familiar to all housekeepers—that one mutton fat will remain liquid on a warm platter when another will become solid. The great difference between the melting point and the solidifying point of the same fat explains why it is that when the fats of mutton are once liquefied, they can, with comparative ease, be kept from again solidifying. If everything connected with the serving of mutton, particularly of those cuts which are likely to include kidney fat, is kept very hot (and, fortunately, the materials out of which serving dishes are made, china and earthenware and metal, retain heat for a long time) there will be little danger of the fat hardening during the period of an ordinary meal.

### Use of Mutton Fat for Gravies.

The fact that some mutton fats solidify easily makes it necessary to take special precautions in the preparation of made gravies, i. e., those that are thickened with flour, for if the fat is intimately associated with the flour its hardening is not so noticeable. Of the two methods of making gravy commonly employed—that of thickening a liquid containing fat with a mixture of flour and water, and that of heating flour in the fat and then adding the liquid—the latter is to be preferred in the case of mutton. It should be added, however, that the argument for this method is based chiefly on greater palatability, and the fact should not be overlooked that some persons consider gravies so made to be unwholesome even when the fat has not been heated sufficiently to be decomposed, a belief which apparently has not been tested in the laboratory.

In order to bring together the various ways of using mutton fat into the preparation of one dish, the following experiment was made: In the making of mutton croquettes, mutton fat was used in three ways—in the thick white sauce with which the chopped meat was mixed; for frying; and in tomato sauce, which was served with the croquettes. Except for the frying, fat from the leg was used; for frying, rendered mutton suet was used. Pains were taken to serve the croquettes hot, and the results were pronounced satisfactory by those who were asked to pass judgment upon the dish.

### CARE OF MUTTON IN THE HOME.

Because of the facility with which mutton absorbs odors and flavors, special care should be taken of it in the home. When it comes into the house, it should be wiped thoroughly with a damp cloth, and all portions that have the slightest

unpleasant odor about them should be cut off. Such portions are most likely to be found where the layer of meat is thin as, for example, on the lower end of the leg, on the flank, or on the ribs. When a large piece of mutton is bought, these facts should be kept in mind in determining which parts should be used first. It is well, for example, to remove the flank end of the loin and part of the rib bones first, and use them for soups or stews. The removal of the membrane and the red skin from the surface of the meat before it is cooked is also desirable. In roasting mutton, many housekeepers believe that it is well to keep the meat well up from the pan by means of a rack, for if this is not done, the fat of the meat is likely to become scorched and to affect the flavor of the meat itself.

### CUTS OF MUTTON.

For the wholesale trade a carcass of mutton is usually cut into two pieces of almost equal weight. The line of cutting is between the first and second ribs. The back half or saddle includes leg and loin, the former being about two-thirds and the latter one-third of the weight. Of the front half the rack or rib constitutes two-fifths and the breast and shoulder (including the neck and foreleg) about three-fifths of the weight. These two saddles when separated lengthwise make the fore and hind quarters—cuts commonly bought for home use. Besides these, the kidney, heart, tongue, and brains are often used for food. The head is often sold whole, and the feet are used for food in some places.

The method of cutting meats varies somewhat in different localities. Fig. 1 is based on data reported in a bulletin<sup>1</sup> of the Illinois Experiment Station, and shows the location of the larger cuts on the whole carcass (A) and on the side (B). Such cuts as chops would be made by further subdividing the cuts indicated; for instance, the rib cuts would be cut into rib chops.

In considering the uses of various cuts of mutton the anatomy of the animal should be noted and also the amount of exercise which the different parts have received during life, for muscular activity tends to make the flesh tough and at the same time is thought to increase the amount of extractives or flavoring material. Meat taken from a part of the animal, therefore, which has been subjected to much muscular action is likely to need longer cooking than that

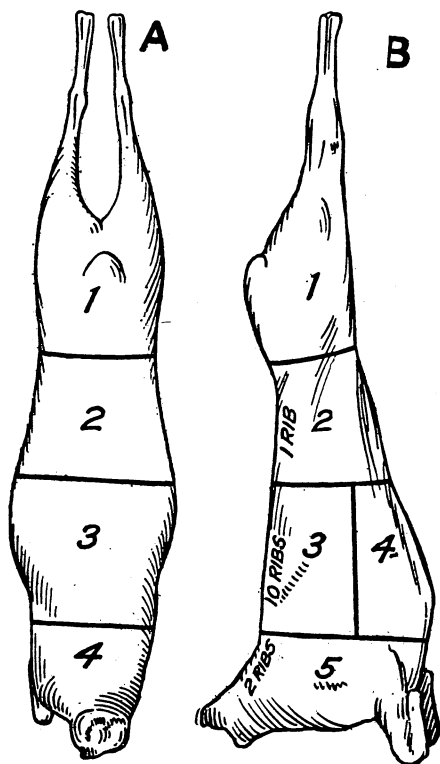


FIG. 1.—Mutton and lamb cuts: A, on the whole carcass; B, on the side.

<sup>1</sup> Illinois Expt. Sta. Bul. 147.

taken from portions which have been little used. Such meat, however, is because of its abundant supply of extractives, even more suitable than the tenderer portions for making full flavored soups, broths, and stews.

In general it may be said that the tenderest portion of the flesh of the sheep, as of other animals, is that which lies under the backbone. This part, which is known as the tenderloin, is found partly in the hind quarter and partly in the fore quarter. It constitutes the greater part of the edible portion of the loin and an even greater percentage of the edible portion of the rib. Except for the rib, the fore quarter is less tender than the hind quarter, for its muscles have been more used.

#### **The Hind Quarter—The Leg and Loin.**

The hind quarter contains a smaller percentage of bone, besides being, as noted above, more tender on the average than the fore quarter. For these reasons it brings a higher average price per pound in spite of the fact that the rib is usually higher priced than any cut from the hind quarter.

The leg contains the smallest percentage of waste of all the principal cuts of mutton. It is often roasted, but a much more common mode of preparation is by boiling. Part of the thicker portion of the leg is often cut off in the form of steaks. When the leg is thus reduced in size, it is better to steam than to boil the remaining portion, for by the former process more of the juice is retained. A part of the leg is more convenient for roasting than the whole.

The loin is either used whole or is cut into chops. From an ordinary loin 8 to 10 chops 1 inch thick may be cut. If an attempt is made to cut a larger number, part of the hip bone is likely to be included. The true loin contains only the small bones of the spine. A saddle of mutton, as the term is used in cookery, consists of the two sides of the loin cut off in one piece. A very thick chop from the loin is called an English chop.

The loin includes, besides the tenderloin, a small amount of comparatively tough meat from the flank. Since the percentage of this tough meat is small, this cut is suitable for being cooked by the quicker processes, i. e., by roasting, broiling, panbroiling, and frying. Sometimes the flank is rolled around the tenderloin and skewered in order to make a more shapely piece of meat.

#### **The Fore Quarter—The Rib, Shoulder, and Breast.**

While the fore quarter has the disadvantage over the hind quarter of having a larger percentage of bone and being tougher, it has the very great advantage of being more abundantly supplied with extractives or flavoring substances. With the exception of the rib, therefore, it is especially suitable for the preparation of broths, soups, stews, or fricassees. The meat of the neck is so tough and the percentage of bone is so great that it is seldom used in this country except for broths, for which its fine flavor and richness in extractives makes it particularly suitable. In other countries cutlets are often taken from the neck. Such use demands special care in getting the meat into shape after the bone has been removed, but the fine flavor of the meat is likely to make this extra work seem worth while.

The rib contains, besides the tenderloin, a small amount of tougher meat lying parallel with the bone. This is sometimes trimmed away to make what is known as the French chop. The percentage of bone in the rib is greater than that in the loin—a point which must be taken into consideration in estimating the comparative values of the cuts. The rib is somewhat less convenient to use, too, than the loin, for, because of the position of the bones, there is less choice

about the thickness of the chops. The rib, being very tender, may be prepared by the same quick processes as the loin, i. e., by roasting, broiling, panbroiling, and deep-fat frying. Since the chops are usually thinner than loin chops, they are especially suitable for being egged, crumbed, and fried in deep fat, for by this process little juice is lost.

The breast may be rolled and roasted, but it will usually be found desirable to cook it for a short time in water first. The shoulder is roasted either whole or with the bone removed. If the bone is removed, the space should be filled with a savory dressing.

#### Kidneys, Liver, Heart, and Head.

The kidneys are broiled, fried, or stewed. The liver is usually braised. The heart is cooked in water after having been fried. The head may be cooked whole in a small amount of water and the meat removed from the bones and scalloped. The brains are boiled and then fried. The tongue is boiled or par-boiled, after which it may be prepared in a great variety of ways.

#### JUDGING MUTTON.

There are a number of points which should be borne in mind when purchasing mutton for the table. The lean portion of the meat should be firm, finely grained, and of a deep red color. The fat should be well distributed. The leg should be nearly covered with a layer of fat and there should also be a thick layer over the back. This outside layer is often in the trade referred to as the "covering." The fat itself should be white, hard, brittle, and flaky. The "mottling" of the flesh with fat, which is so important a sign of good quality in beef, is considered of less importance in judging mutton.



FIG. 2.—Quality and economy of mutton as related to distribution of fat and lean: a, fat layer around lean too small for good quality; b, fat and lean well distributed; c, fat layer too large and corresponding waste too great.

For superior quality, lean and fat should be well distributed, i. e., the lean portion should contain a fair percentage of fat in its tissue and be surrounded wholly or in part by a reasonable layer of fat. The right distribution of fat is important since it affects both flavor and quality. If the meat is too lean, it is not so palatable when cooked; if too fat, it is not economical, since the excessive quantity would remain uneaten, and when purchased in the form of an expensive roast is high in cost in comparison with similar fat which could be purchased for culinary use. Fig. 2 illustrates these points.

#### WASTE IN VARIOUS CUTS.

In estimating the relative values of the various cuts and the prices which should be paid for them per pound it is necessary to know the percentage of waste in each. The following figures from an earlier bulletin<sup>1</sup> of the department represent averages of a number of determinations: Side (including tallow), 19.3 per cent waste; side (excluding tallow), 18.1 per cent; hind quarter, 17.2 per cent; fore quarter, average 21.2 per cent; leg, 17.7 per cent; loin (which includes rib and is without kidney or kidney fat), 14.8 per cent; shoulder, 22.1 per cent; and neck, 26.4 per cent.

<sup>1</sup> U. S. Dept. Agr., Office Expt. Stas. Bul. 28.

**LOSSES OF WEIGHT IN COOKING MUTTON AND OTHER MEATS.**

There have been reported in another bulletin of this department<sup>1</sup> experiments made for the purpose of determining the effect of cooking upon the composition of various kinds and cuts of meat. In the course of this work, comparable cuts of mutton and beef, both taken from the leg, and with nearly the same percentage of fat, were prepared in the same way, i. e., by being boiled in water for three hours. The results showed that the nitrogenous extractives which are so valuable a part of meat broths were as high in the mutton broth as in the beef broth. On the other hand, the percentage of fat in mutton broth was noticeably higher than in the beef broth, although the meat from which the broth was made had a slightly smaller percentage of fat. This would indicate that mutton fat is removed more easily from the tissues in the process of cooking than is beef fat.

**EFFECT OF HEAT UPON THE VARIOUS CONSTITUENTS OF MUTTON.**

In considering the various ways of preparing mutton, the effect of heat upon its different constituents should be noted. The proteins of mutton, as of other meats, are numerous, but they fall naturally into two classes—those which are insoluble in cold water and those which are soluble. In a previous publication of this department<sup>1</sup> it was shown that in the case of beef the proteins soluble in water constituted about 13 per cent of the whole, and the proteins of mutton probably differ slightly in this respect from those of beef. Both the soluble and insoluble proteids are hardened by the application of heat, and a large percentage of the soluble proteins are rendered insoluble. In the publication referred to, it was stated that of the proteins of beef which had been cooked in hot water for several hours only 0.4 per cent were soluble, as compared with 13 per cent in the raw meat.

When meat is soaked in cold water, not only are the soluble proteins removed but also all of the extractives or flavoring materials and a large percentage of the mineral matter. When this water extract is heated, the proteins begin to coagulate at 52° C., or about 126° F. The process seems to be completed at about 85° C., or about 185° F. The extractives, on the other hand, are not made insoluble by heat and remain in solution even at the temperature of boiling water.

The effect of hot water during cooking, either the water naturally present in the meat or that in which meat is cooked, upon the gelatinoids of the meat, which form the chief solid constituent of its connective tissue, is to convert them into gelatin—a substance which unites with water to form a jelly. The effect, therefore, of long-continued cooking of meat, particularly in water, is to soften or destroy the connective tissue, and thus to separate the fibers of the meat from each other.

The fat, which constitutes a large percentage of the nutrients of meat, is not affected chemically in cooking except by very high temperatures, such as may be obtained in frying, broiling, and roasting. When due care is taken, the effect of cooking it is merely to release it from the tissues. The very high temperature to which fat can be brought without being changed, accounts for its usefulness in the culinary process known as “basting,” which consists in repeatedly searing the surface of the meat while it is being roasted by pouring hot fat or a mixture of hot fat and water over it.

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<sup>1</sup> U. S. Dept. Agr., Office Expt. Stas. Bul. 162.

### METHODS OF COOKING MUTTON.

In the following pages there are given a large number of recipes which have been brought together from many sources. Most of them are for standard dishes. Some of them, however, are for dishes which, though highly esteemed in other countries, are not well known in the United States, and a few are for rather complicated dishes. The insertion of these recipes for unfamiliar and elaborate dishes should not be taken to indicate that a greater value is placed upon them than upon mutton prepared by the simple methods of boiling, roasting, or broiling. They are included because tests have shown them to be palatable, and because a knowledge of many ways of preparing any given food is an easy way of securing variety in the diet. More necessary than to know how to prepare mutton in a variety of ways is to keep in mind the essential factors which contribute to its satisfactory preparation in simple ways, i. e., the careful removal of all portions having an unpleasant odor, the mastery of the art of preparing well a simple gravy, and care to keep hot such dishes as are intended to be served hot.

Even if we recognize the advantage of simple methods skillfully followed out over complicated methods, we must recognize also that if a greater number of modes of preparation were understood in this country and if a greater variety of savory sauces were used the possibilities of serving mutton in acceptable forms would be greatly increased.

That quality of mutton which makes it absorb odors and flavors easily is an advantage in cooking, for its own flavor combines easily with that of the various seasonings in cooking, and, for this reason, the meat yields itself readily to the preparation of savory dishes. The experience of cooks has, in fact, taught two general ways of cooking mutton, one of which consists in developing its own flavor by cooking it alone, and the other in uniting it with highly seasoned vegetables or other substances in such a way as to modify its flavor and to produce a new flavor by the combination. The two methods are well illustrated by recipes for boiling mutton given on pages 19 and 20. The first of these directs that it be cooked in water unseasoned by other substances than salt; the second, that such substances as herbs, onions, or garlic be rubbed into the meat and bound closely to its surface by means of a cloth before the meat is put into water.

### METHODS OF MEASURING.

Many of the recipes brought together for this bulletin were very indefinite in their statement of amounts of ingredients. For this reason special attention has been given to the matter of measurements, and wherever it has been considered essential the amounts are given exactly. The measurements in all cases are level. A teaspoonful of an ingredient, for example, means enough to come up to the edge of the bowl of the spoon. Such an amount is conveniently measured by first taking up more than is needed and then pushing off any in excess by means of a knife, allowing the edge of the knife to rest on the spoon.

### MAKING OF SOUPS AND BROTHS.

An object to be kept in mind in the making of broths and soups is to get as much as possible of the flavoring bodies and of the nutritive material of the meat into solution or suspension in the water. This is accomplished, first, by dividing the meat into small pieces in order to increase the surface exposed, and, second, by keeping the temperature low in order to prevent the proteids from



coagulating. When the water in which the meat has been soaked is brought to the temperature of about 52° C., the dissolved proteids begin to harden and rise to the surface in the form of scum. This scum is often removed for esthetic purposes, but it should be remembered that the effect of doing this is to reduce the nutritive value of the broth. Whenever there is the slightest doubt about the quality or the freshness of the meat, however, the removal of the scum is recommended, for under these circumstances its removal seems to improve the flavor.

Practically the only nutritive material left in a broth, which has been cleared and from which the fat has been removed, is gelatin and a little mineral matter. Gelatin is usually described as a protein sparer. So far as we know at present, it does not have much value either in building or repairing tissues. However, when it is taken in the food, less protein seems to be required. The amount of gelatin present, even in the richest soup, is very small, and for invalids it is sometimes desirable to leave the albumin of the meat juice in solution in the broth. This can be done if the broth is not heated above 130° F.

Recipes for mutton broths and soups follow:

#### Mutton Juice and "Extract."

Mutton juice or "extract" may be prepared according to any of the ways recommended for beef juice or homemade "extract." One way is to broil a piece of the meat on both sides, and then cut it into small pieces and extract the juice, for instance, by pressing it with a lemon squeezer or between two plates with a heavy weight on top. The object of broiling has usually been said to be "to start the flow of the juice." An additional reason, however, may be found in a bulletin of this department<sup>1</sup> which shows that there is a much greater percentage of soluble material in meats cooked by dry methods, such as roasting, broiling, frying, and panbroiling, than in those cooked in hot water. A less concentrated extract is made by cutting the meat into small pieces and cooking it in water with the precaution mentioned above—that of keeping the water below 130 F. This is most conveniently done in a double boiler or in a glass fruit jar immersed in water.

#### Mutton Broth.

3 pounds mutton from the neck.	3 tablespoons rice or barley.
2 quarts cold water.	1 teaspoon salt.

Wipe the meat, remove the skin and fat, and cut the meat into small pieces. Put into the kettle with bones, and cover with the water. Heat gradually to the boiling point and season with salt and with pepper if liked. Cook slowly until the meat is tender, strain, and remove the fat. Reheat to boiling point, add the rice or barley, and cook until the rice or barley is tender. If barley is used, soak it over night in cold water.

#### Mutton Soup.

4 pounds mutton from the neck.	Few sprigs parsley.
3 quarts cold water.	1 medium-sized onion.
3 carrots.	6 cloves.
2 turnips.	1 sprig thyme.
1 small cabbage or part of a larger	1 sprig marjoram.
cabbage.	2 tablespoons salt.
1 stalk celery.	

Wipe the meat carefully, cut into small pieces, and cover with the water. Bring very slowly to the boiling point and skim. Add the vegetables cut into small pieces and other seasoning, and cook slowly for three hours. Strain, cool, and remove the fat. Serve either clear, with rice, or with the vegetables finely chopped.

<sup>1</sup> U. S. Dept. Agr., Office Expt. Stas. Bul. 162.

## MUTTON STEWS.

In preparing mutton for stews, several different plans may be followed. The meat may be cut into small pieces and cooked in water, or it may be first browned in fat before being cooked in water. Another way is to mince the raw meat, cook in a little fat, and then combine with vegetables. This is suitable when the vegetables used are very juicy as in Minced Mutton with Eggplant. (See p. 30.)

## Curry of Mutton.

- |  |                          |
|--|--------------------------|
| 2 pounds mutton from the fore quarter. | 1 teaspoon curry powder. |
| 1 onion.                               | Salt.                    |
| 1 teaspoon vinegar.                    | Boiling water.           |
| 2 tablespoons flour.                   |                          |

Cut off small portions of the fat and try them out. Remove the unmelted portions, and in the remainder fry the meat until it is a delicate brown. Add the onions and pour over all enough boiling water barely to cover. Cook until the meat is tender. Add the curry powder, vinegar, and salt. Remove the meat, reduce the broth to one cup, and thicken it with flour diluted with cold water. Add the meat to the gravy and reheat. Serve with rice.

## Okra and Mutton Stew.

- |                                     |                                    |
|-------------------------------------|------------------------------------|
| 1 pound lean mutton free from bone. | 2 cups okra, cut into thin slices. |
| 2 tablespoons butter or drippings.  | 1½ teaspoons salt.                 |
| 2 tablespoons flour.                | ½ teaspoon pepper.                 |
| 2 onions.                           | Water.                             |
| 2 cups tomatoes.                    |                                    |

Wipe the meat and cut it into cubes. Wash the okra and cut into thin slices, dredge it and the meat with the flour, and fry them in the fat until brown. Add the other ingredients, using water enough barely to cover and cook slowly either in the oven or on top of the stove in a tightly covered dish.

## Scotch Broth.

- |  |                                     |
|--|-------------------------------------|
| 1 quart rich mutton broth free from fat. | 4 stalks celery.                    |
| 1 carrot.                                | 2 tablespoons butter or mutton fat. |
| 1 turnip.                                | 2 tablespoons flour.                |
| 2 onions.                                | Salt.                               |

The liquor in which mutton is boiled may be used in preparing this dish, but it will usually need to be boiled down. Cut the vegetables into small pieces and cook them slowly in the stock for two hours. Rub the flour and butter together and add to them a little of the hot broth. Stir until the mixture is smooth, then add it to the broth.

When no mutton stock is on hand, prepare it from 2 pounds of mutton from the fore quarter. Remove the meat from the bone and cut into small pieces and, for convenience, tie the bones in a small piece of cloth and cook in the same water in which the meat is cooked. In this case, serve the meat with the broth.

## Ragout of Mutton with Farina Balls.

- |   |                                 |
|---|---------------------------------|
| 1½ pounds neck of mutton cut into small pieces. | 1 teaspoon salt.                |
| 1 tablespoon butter.                            | ½ teaspoon pepper.              |
| 1 tablespoon flour.                             | ½ bay leaf.                     |
| 1 onion cut into small pieces.                  | 1 sprig parsley.                |
| 1 carrot cut into small pieces.                 | 6 cloves.                       |
| 2 cups hot water.                               | 1 cup fresh peas or ½ can peas. |

Put the butter into a frying pan. When melted add the flour and let it brown. Then add all the other ingredients except the peas, and cook slowly for two hours. A short time before serving, add the peas.

Serve with farina balls made as follows:

1 cup farina.	½ teaspoon pepper.
1 cup milk.	Few drops onion juice.
½ teaspoon salt.	Yolk 1 egg.

Cook farina and milk in the double boiler one hour. Add seasonings and well-beaten yolk. Stir well and cool. When cold, roll into balls. Dip in egg and crumbs and fry in deep fat. Rice may be used in a similar way.

#### Ragout of Mutton with Summer Squash.

2 pounds mutton from the shoulder or breast.	4 medium-sized potatoes.
1 onion.	½ teaspoon powdered thyme.
1 medium-sized summer squash.	½ teaspoon powdered marjoram.
1 sweet green pepper.	Bit of bay leaf.
2 stalks celery.	Garlic. (See below.)
	Salt.

Cut the meat into small cubes and place in a deep baking dish. Cook in a hot oven until well browned. Add the onion cut into cubes, the summer squash sliced, sweet peppers and celery cut into small pieces, and the other seasonings. Sufficient flavor of garlic will be obtained by rubbing the dish with a clove of garlic or by adding a very thin slice from one of the cloves. Cover the dish and allow the vegetables to cook for an hour with the meat, without the addition of water. Then add the potatoes, cut into slices. Cover the dish again and cook for another hour.

#### Ragout of Mutton with Eggplant.

Follow the directions given in the above recipe, substituting an eggplant for the summer squash.

#### Syrian Stew.

2 cups raw mutton cut into cubes.	2 onions.
2 tablespoons fat.	2 cups tomatoes.
2 tablespoons flour.	Salt.
2 cups string beans.	Water.

Dredge the meat with the flour and brown it in the fat. Put all the ingredients in a stewpan, scraping from the frying pan all of the flour and fat, and add enough water barely to cover. Cook slowly until the meat is tender.

#### Haricot of Mutton.

2 tablespoons butter or drippings.	2 cups water.
2 tablespoons chopped onions.	Salt and pepper.
1½ pounds lean mutton cut into 2-inch pieces.	Lima beans.
	Chopped parsley.

Fry the onions in the butter, remove the onions, add the meat, and brown; cover with water and cook until the meat is tender. Serve with a border of Lima beans, seasoned with salt, pepper, butter, and a little chopped parsley. Fresh, canned, dried, or evaporated Lima beans may be used in making this dish.

#### Stewed Sheep's Hearts.

2 sheep's hearts.	½ teaspoon pepper.
2 ounces fat salt pork.	1½ pints boiling water.
2 tablespoons minced onion.	Salt.
2 tablespoons flour.	

Split and wash the hearts, season them with the salt and pepper, and roll them in the flour. Try out the pork, and add the onions to the pork fat and cook them 10 minutes. At the end of that time, remove the pork and onions to a stewpan and fry the hearts in the fat. Transfer hearts to the stewpan. Rinse the frying pan with the water, which should then be poured over the hearts. Use the flour that remains after the hearts are rolled to thicken the broth. Cook the hearts in the gravy for three hours, being careful to keep the

temperature just below the boiling point. At serving time, the hearts are usually sliced and the gravy poured over them.

#### Sheep's Tongues.

6 sheep's tongues.	2 slices bacon.
2 carrots cut into small pieces.	$\frac{1}{4}$ cup capers.
1 pint boiling water.	3 small cucumber pickles.
1 large onion cut into small pieces.	Salt and pepper.

Scald and blanch the tongues, removing the skins and then throw the tongues into cold water until ready to use. Cut a slice of bacon into fine strips and lay them in the bottom of a saucepan; place over this the lamb tongues seasoned with salt and pepper, and over the tongues another layer of bacon in very fine strips. Add the minced carrots and onion; salt and pepper again to taste and let the tongues simmer for about 15 minutes, and then moisten with about a pint of boiling water or broth. Cook slowly about three hours. Then take out the tongues, place them on a hot dish, strain the sauce, reheat, and add one-fourth cup of capers and three small cucumber pickles, sliced thin. Stir well and let the sauce boil up once. Pour over the tongues and serve.

#### BOILING, STEAMING, AND BRAISING.

Boiling, as the term is usually used, consists in cooking in water enough to cover, and at the temperature of boiling water. The best results are obtained by using large pieces of meat because, in this case, less of the flavoring material is lost than if the meat is cut into small pieces. Recipes for boiling meat usually direct that the meat be put into boiling water, and that the temperature be again brought to the boiling point as quickly as possible and kept there for a few moments in order that the proteins on the surface of the meat may coagulate and form a crust. It has been thought that by this means a crust is formed which tends to keep in the juices of the meat. In a previous bulletin of this department,<sup>1</sup> however, it has been shown that experiments do not bear out this belief. Pieces of meat were put into cold water and slowly brought up to the boiling point, and similar pieces were plunged into boiling water. At the end of the given time it was found that there was no essential difference between the amount of material which had been extracted from the meat in the two cases.

For the common custom of searing the surface of the meat in hot fat before boiling it, there is more theoretical justification, for the high temperature develops new flavors and also, as we have said before, this form of cooking tends to increase the soluble materials of the meat.

Two substitutes for boiling by ordinary methods should be mentioned. One is braising, which consists in cooking in a closely covered earthenware dish in the oven; the other is cooking in a fireless cooker. The formal name of the dish used for braising is the "casserole," but any heavy dish supplied with a close-fitting cover will serve the purpose. A heavy plate may be used for the cover. The advantage of this way of cooking over ordinary boiling is that less water is necessary and the broth is, therefore, richer. The advantage of cooking in a fireless cooker is that it is not necessary to watch the meat during the process. When this method is employed in cooking a leg of mutton, 3 or 4 quarts of water should be used and the meat should be boiled for one-half hour before it is placed in the cooker, and should be cooked six hours or more afterwards.

#### Boiled Leg of Mutton.

After wiping the meat thoroughly with a damp cloth, cover it with water which, if haste is an object, should be hot. Cook about 15 minutes for each

<sup>1</sup> U. S. Dept. Agr., Office Expt. Stas. Bul. 162.

pound, keeping the temperature a little below the boiling point. The proper temperature will be indicated by a slight bubbling. When the meat is partly done, add the salt and water.

#### Boiled Mutton with Vegetables.

To the water in which a leg of mutton is boiled the following may be added:

2 sliced carrots.	2 stalks celery.
1 sliced turnip.	1 bay leaf.
2 sliced onions.	2 cloves.

The advantage of using these additional substances is that besides flavoring the meat and making an attractive garnish for it, they add flavor to the broth and thus improve it for use in soups or sauces.

#### Boiled Mutton with Sweet Herbs.

After the leg of mutton has been wiped, mix the following and spread over the surface. Wrap the meat in a cloth and fasten the cloth about the meat by means of a cord or skewers in order to hold the seasonings close to the surface:

1 clove of garlic, finely chopped.	1 teaspoon powdered sweet marjoram.
1 finely chopped onion.	1 teaspoon salt.
1 teaspoon powdered thyme.	

#### Boiled Mutton with Oyster Sauce.

4 pounds mutton from the shoulder.	1 pint oysters.
1 onion.	Salt.

Bone the mutton and stuff with half the oysters, or make a gash in the meat near the bone and insert half the oysters and tie into shape. Half cover the meat with water and cook in a closely covered dish for 2 hours. With the remaining oysters make the following sauce:

#### OYSTER SAUCE.

2 tablespoons butter or mutton fat.	½ cup of the liquid in which the mutton has been boiled.
1 tablespoon flour.	
½ pint oysters.	

Drain the oysters and heat and strain the liquor. Wash the oysters, add them to the hot oyster liquor and cook until they are plump. Remove the oysters and keep warm while making a sauce of the butter, flour, oyster liquor, and mutton stock. Add the oysters and season with salt and pepper.

#### Steamed Mutton.

Small pieces of mutton may be very satisfactorily prepared by covering the surface with powdered or finely chopped seasonings, as suggested in the foregoing recipe, and steaming it, or it may be steamed without the seasonings.

#### Sauces for Boiled or Steamed Mutton.

##### CAPER SAUCE.

½ cup butter or mutton fat.	½ teaspoon salt.
1½ cups hot water or mutton broth.	½ cup capers drained from their liquor.
2 tablespoons flour.	

Melt half the butter or all the mutton fat, add the flour, and cook thoroughly. Pour the hot water or stock on gradually. Before serving, add the remaining butter (if this is the fat used in preparing the dish) and the capers. If the gravy is made somewhat thicker than as above directed it can be spread over the surface of the meat. This covers any irregularities in the surface and is thought by some people to improve the appearance of the dish.

## MOCK CAPER SAUCE.

For the capers in the above recipe, chopped sour pickles may be substituted.

## PARSLEY SAUCE.

2 tablespoons butter or mutton fat.	Salt.
2 tablespoons flour.	Juice of $\frac{1}{2}$ lemon.
1 cup milk or mutton broth.	1 tablespoon finely chopped parsley.

Melt the butter, add the flour, and cook for two or three minutes, stirring constantly. Add the milk and cook until the liquid is thickened. Season with salt. Just before serving add the lemon juice and parsley.

## HORSE-RADISH SAUCE NO. 1.

(For cold boiled mutton.)

2 tablespoons cracker crumbs.	$\frac{1}{2}$ teaspoon salt.
2 tablespoons butter or mutton fat.	1 cup milk.
$\frac{1}{2}$ cup grated horse-radish root.	

Cook the crumbs, horse-radish, and milk 20 minutes in a double boiler. Add the remaining ingredients and serve either hot or cold.

## HORSE-RADISH SAUCE NO. 2.

$\frac{1}{2}$ cup thick cream.	1 tablespoon vinegar.
3 tablespoons grated horse-radish root.	Salt and cayenne.

Whip the cream and add the other ingredients.

## Mutton Savory Loaf.

2 pounds lean mutton free from bone.	1 cup milk.
2 pounds lean fresh pork free from bone.	2 eggs.
1 small onion.	$\frac{1}{2}$ teaspoon each curry powder, powdered thyme, black pepper, and paprika.
1 green pepper.	$1\frac{1}{2}$ tablespoons salt.
2 stalks celery.	1 pound bacon sliced very thin.
1 bunch parsley.	

Remove the seeds from the pepper and put the vegetables and meat through a meat grinder, using the finest chopper for the vegetables, and chopping the meat about as fine as for Hamburg steak. Mix thoroughly all the ingredients but the bacon. Form the chopped meat mixture into a roll about 2 or 3 inches in diameter; cover the sides and ends completely with the bacon, roll in a pudding cloth or a piece of cheesecloth, and tie securely. This can be conveniently done by laying the cloth on a flat surface, and then laying the strips of bacon upon it side by side in such a way as to form a continuous layer large enough to cover the whole surface of the meat roll. Put the meat roll in the center, and bring the bacon up around the sides and ends. The cloth should be tied securely at the ends, and either pinned or sewed securely at the side. Boil for three hours in just enough water to cover, to which has been added one tablespoon of salt and one-half cup of vinegar. This may be served cold or may be cut into slices and fried. This mixture may also be either steamed in a mold or baked. If this is done, the bacon should be used to line the mold and cover the top of the mixture. If baked, it is well to add to the meat mixture a cup of bread crumbs and one-half cup more milk.

For the fresh pork in the above, either an equal amount of ham, veal, or a mixture of veal and salt pork, may be substituted. When ham or salt pork is used reduce the amount of salt.

## Braised Leg of Mutton.

1 leg mutton.	1 sprig each thyme and parsley.
$\frac{1}{2}$ medium-sized onion.	$\frac{1}{2}$ cup mutton drippings or butter.
1 carrot.	$1\frac{1}{2}$ teaspoons salt.
1 turnip.	12 peppercorns.
$\frac{1}{2}$ bay leaf.	3 cups hot water.

Have the leg of mutton boned. Wipe, stuff with the mixture described below, sew, and place in a deep pan. Cook the onion (sliced), the carrot and turnip (cut into dice), bay leaf, thyme, and parsley five minutes in the butter or mutton drippings. Add the hot water, salt, and peppercorns, and pour the mixture over the mutton. Cook slowly for three hours, with the dish covered except for the last half hour. Make a brown gravy out of the strained broth in which the meat has been cooked. (See p. 23.)

#### STUFFING FOR BRAISED LEG OF MUTTON.

The stuffing for the braised leg of mutton is made as follows:

1 cup cracker crumbs.	½ teaspoon pepper.
2 tablespoons melted butter.	½ teaspoon poultry seasoning.
¼ teaspoon salt.	¼ cup boiling water.

#### Oven Pot Roast.

3 pounds mutton from the shoulder.	¼ cup sliced onion.
1 cup potatoes cut into small pieces.	2 tablespoons flour.
1 cup carrots cut into small pieces.	Salt.

Put the meat into an earthenware bean pot and cover with boiling water. Place the cover on the pot and let the meat cook in a moderate oven for two hours. Add the vegetables and the salt, cover again, and cook for one hour. Reduce the liquid in which the meat and vegetables have been cooked to one cup and thicken with the flour.

#### Shoulder of Mutton Braised with Turnips.

6 pounds mutton from the shoulder.	½ bay leaf.
1 onion.	1 quart water.
1 carrot.	6 turnips.
1 stalk celery.	Salt.
4 cloves.	

Cut the onion, carrot, and celery into small pieces and put these with the shoulder of mutton into a deep baking pan. Cover, and allow the mutton juice to permeate the vegetables and brown with them. Then add the water, cloves, and bay leaf. Cook in a moderate oven until the meat is tender, which will be about 20 minutes for each pound. One hour before serving, add the turnips, which have been peeled and parboiled.

#### Braised Breast of Mutton.

1 breast mutton.	1 lemon.
Few slices bacon.	1 onion.
½ pint stock.	Salt.

Line the bottom of a casserole or other earthenware baking dish with a few thin slices of bacon, lay the mutton on these, and put over it the lemon, which has been peeled and cut into slices. Cover with one or two more slices of bacon and add the stock and onion. Cover the dish. Cook slowly on the top of the stove or in the oven until the meat is tender.

#### Mutton Smothered in Tomatoes.

1½ pounds mutton steak.	Salt.
1 cup bread crumbs.	1 can tomatoes, or 1 quart fresh
1 small onion.	tomatoes cut in slices.
Poultry seasoning.	

Spread over the mutton steak a layer of bread crumbs mixed with the minced onion and other seasonings. Roll and tie into shape. Place in a casserole or other dish with a tightly-fitting cover. Pour the tomatoes over the meat and cook very slowly in the oven or on top of the stove for three or four hours. If the tomatoes do not cover the meat, add a little boiling water.

**Braised Leg of Mutton with Sour Gravy.**

1 leg of mutton.	$\frac{1}{2}$ cup each of celery, carrots, and
2 tablespoons butter or drippings.	onions finely chopped.
3 cups vinegar.	2 tablespoons chopped parsley.
3 cups water.	1 dozen pepper corns.
$\frac{1}{2}$ teaspoon each of powdered thyme	$\frac{1}{2}$ bay leaf.
and marjoram.	1 pint sour cream.
$\frac{1}{2}$ dozen cloves.	$\frac{1}{2}$ pint stock.
1 clove of garlic.	Salt.

Fry the celery, carrots, and onions in the fat until light brown, add the vinegar and water, and cook until the vegetables are soft. When this mixture is cool, pour over the leg of mutton, which should be fully covered and which, for this reason, should be in a dish just large enough to hold it. Allow the mutton to lie in this mixture for 24 hours. Upon removing it, drain quite dry and bake in a moderate oven for 30 minutes. Then pour the sour cream and stock around it and cook until tender, basting frequently. Reduce the liquor in which the meat has been cooked to a small volume, strain it, and pour over the meat.

**ROASTED MUTTON.**

The term "roasting" was originally applied to cooking before an open fire, but as now used it is usually synonymous with baking. Since meat cooked by this process is subjected to dry heat, even greater precautions must be taken to prevent the escape of juices than in boiling. The oven should be very hot until the meat is thoroughly seared; then the temperature should be reduced and the fat which drips from the meat should be frequently poured over its surface.

**Roast Leg or Saddle of Mutton.**

Sprinkle the meat with salt and pepper, place upon a rack in the baking pan, and dredge with flour. Bake in a hot oven, basting frequently. Allow from 10 to 15 minutes per pound, depending upon whether it is desired well done or not.

**BROWN GRAVY FOR ROAST MUTTON.**

In making gravy for roast mutton or any other, roast meat, allow 2 level tablespoons of fat for each cup of gravy desired, pouring off any in excess of this amount. To the fat add 3 tablespoons of flour and cook thoroughly, browning it, but being very careful not to burn it. Add boiling water or broth and boil for a short time, stirring constantly. Add salt and pepper. The proportions are 2 tablespoons of fat, 3 tablespoons of flour, and 1 cup of water or stock. If the flour is not browned, only 2 level tablespoons are needed for each cup.

**CURRENT-JELLY GRAVY.**

A gravy flavored and made acid with currant jelly is often served with roast mutton. To each cup of brown gravy made from the fat of roast mutton add a glass of currant jelly or less. As noted elsewhere (p. 29), the addition of currant jelly is specially suitable when cold mutton is to be warmed up in gravy.

**MINT SAUCE AND MINT JELLY.**

$\frac{1}{2}$ cup finely chopped mint leaves.	$\frac{1}{2}$ cup vinegar.
1 tablespoon powdered sugar.	$\frac{1}{2}$ teaspoon salt.

Combine the ingredients and let the mixture stand in a warm place until the flavor of the mint has penetrated the liquid.

Mint sauce, which is so generally relished with roast mutton and roast lamb, may be made from either the fresh or the dried spearmint. Mint jelly, which is also popular, can be made by stiffening mint sauce with gelatin. For this purpose one-half tablespoonful of gelatin soaked in cold water enough to cover it may be used with a cup of mint sauce made as above from freshly chopped mint



leaves; or make a mint sauce by boiling together one cupful each of vinegar (not too strong) and sugar for about five minutes and adding three-fourths cupful finely chopped mint leaves and one-fourth teaspoonful of salt and a very little paprika. To this add one and one-fourth tablespoonfuls granulated gelatin which has been softened in a little cold water. Cool the mixture and stir until it begins to thicken and then pour it into small molds or glasses. The amount of mint may be increased if a stronger flavor is liked. This jelly can be kept only a short time.

Mint jelly is also made by flavoring apple jelly with green mint leaves. Two pounds of apples cut in quarters are cooked with water to cover until soft, as for ordinary jelly, and three cups of green mint leaves and tops are added about 10 minutes before the cooking is completed. To the juice drained from the apple and mint, three-fourths of a cupful of sugar and the juice of a large lemon are added, and the jelly is cooked until a little tested on a cold plate will harden. It is then strained into hot jelly glasses.

Housekeepers commonly tint jelly made by either method with a little vegetable green coloring matter.

### Leg of Mutton Stuffed and Roasted.

For this purpose have the leg of mutton cut into two pieces and use the thicker end, which should be boned. Stuff the boned piece and tie into good shape. Roast in a hot oven, allowing about 10 minutes for each pound if the meat is desired rare, 15 if desired well cooked. In making the gravy, follow the directions on page 23.

### Dressing for Roast Mutton.

1 pint stale bread crumbs.	1 teaspoon sweet marjoram.
$\frac{1}{2}$ cup cracker crumbs.	Salt and pepper.
$\frac{1}{2}$ teaspoon sage.	Few drops onion juice.
2 tablespoons butter.	

Soak the bread in cold water. Press out nearly all the water, and add the other ingredients.

### Roast Ribs of Mutton with Apples.

After wiping the meat, spread over the surface one finely chopped clove of garlic, one chopped onion, one-half teaspoon each of powdered thyme and marjoram, and one teaspoon of salt. Place on a rack and roast in a moderate oven from one and one-half to two hours, basting frequently. Place potatoes and sour apples around the roast, the former one hour before serving and the latter one-half hour. The apples will prove a palatable accompaniment to the roast and will impart their flavor to the gravy, which should be made according to directions on page 23.

### Roast Mutton with Bananas.

Peel the bananas and bake them for 30 minutes under the mutton. Tart fruit relishes, such as spiced currants or those given below, may be served with the bananas.

### FRUIT RELISHES WITH ROAST MUTTON.

1 cup prunes cut into small pieces.	$\frac{1}{2}$ teaspoon ground cinnamon.
$1\frac{1}{2}$ cups water.	2 tablespoons currant jelly.
3 tablespoons sugar.	Juice of $\frac{1}{2}$ orange.

Boil together until the prunes are soft.

For the prunes in this recipe raisins or a mixture of equal parts of raisins and prunes may be substituted. One-fourth cup of butter is sometimes added.

These fruit relishes may be served also with sliced cold lamb or mutton and are very palatable.

### Roast Mutton with Turnips.

Turnips are frequently cooked under roast mutton. They are sometimes stuffed. To prepare in this way, first parboil the turnips and then scoop out

a portion of each by means of a spoon and fill the cavity with bread which has been soaked in cream or in milk to which a little melted butter has been added.

#### Baked Breast of Mutton.

Sew up a breast of mutton in a very thin cloth, put it into a stewpan, pour over it enough cold salted water to nearly cover it, and let it simmer, allowing 10 minutes to each pound. Then take it out of the saucepan and out of the cloth, put it in a baking dish, rub it over with mutton drippings, butter, or savory fat, sprinkle some flour over it, and bake for one-half hour in a hot oven, basting frequently with its own broth. Five minutes before taking it out of the oven strew fine dry bread crumbs thickly over it, put little bits of butter here and there, and let it brown. Serve with a brown sauce made from the broth in which the meat was cooked.

#### Mutton and Potato Pie.

1 pound mutton from the shoulder.	6 medium-sized potatoes.
1 onion.	1 teaspoon baking powder.
$\frac{1}{2}$ cup flour.	1 tablespoon butter.
1 carrot.	Salt.

Cook the onions, carrots, and meat together in water enough to cover. Boil the potatoes separately. Reserve enough of the potatoes to make a cup of mashed potatoes. Cut the remaining potatoes and the other vegetables and meat into small pieces, and place in a baking dish. Cover with some of the broth thickened with the flour. Mash the remaining potatoes. Add butter and salt. Mix this with the flour which has been thoroughly sifted with the baking powder. Spread this mixture over the ingredients in the baking dish, and bake in a hot oven until the crust is brown.

#### BROILING.

Broiling is a process closely akin to roasting, as the term was formerly used. It is performed over a clear fire, and relatively thin pieces of meat only are suitable for the purpose. The searing of the surface, which can be accomplished very quickly, is usually sufficient for the retention of the juices. In the case of meats having little fat, however, butter or other fat should be rubbed over the surface before the cooking is begun.

Chops from the loin or the rib, cutlets from the leg, or thick pieces cut from rare boiled or roasted mutton are suitable for broiling. When it is not convenient to broil, much the same results can be secured by pan broiling, i. e., cooking in a hot pan lightly greased.

#### Broiled Loin Chops.

Remove superfluous fat and roll the flank about the tenderloin, fastening it with skewers. Place on a broiler greased with some of the mutton fat. Cook from six to eight minutes, turning frequently during the first part of the time. A sauce of butter to which a little lemon juice and chopped parsley have been added is sometimes rubbed over the chops, or since the chops themselves contain much fat, lemon juice and parsley only may be used, or the chops may be served on thin slices of lemon. Onion sauce is by some people considered a great delicacy for serving with broiled chops.

#### Sauces for Broiled Loin Chops.

##### PARSLEY AND BUTTER SAUCE.

$\frac{1}{2}$ cup butter.	$\frac{1}{2}$ tablespoon finely chopped parsley.
$\frac{1}{2}$ teaspoon salt.	$\frac{1}{2}$ tablespoon lemon juice.
$\frac{1}{2}$ teaspoon pepper.	

Cream the butter, add the salt, pepper, and parsley, and then the lemon juice very slowly.

## ONION SAUCE.

6 large white onions.	1 teaspoon sugar.
$\frac{1}{4}$ cup butter.	$\frac{1}{2}$ cup cream.
1 tablespoon flour.	Salt.

Cut the onions into two or three pieces each, and cook them for 10 minutes in boiling salt water. Strain them and cook in a covered saucepan with the butter for about three-fourths hour or until they are very tender. Press through a purée sieve and reheat. Sprinkle the flour over them, stirring it in thoroughly, and add the seasonings. Bring to the boiling point and heat long enough to cook the flour thoroughly.

## Pan-Broiled Loin Chops.

Pan broiling is a method of cooking employed when there is no suitable fire for broiling. For best results it should be employed only in the case of meat from which most of the fat has been removed. Loin chops which are to be pan broiled should have the flank and most of the fat removed. After wiping they should be put into a hot frying pan and turned frequently. In order to avoid piercing the chops in turning them, they should be grasped between two forks or with a knife and fork. The time of cooking will depend, of course, upon the thickness of the chops and whether they are desired well done or not. From 6 to 10 minutes is the usual time. Pressing the chop against the side of the frying pan will help to complete the cooking. Pan-broiled chops may be served plain or with savory, tomato, or onion sauce. (See above.)

## Sauces for Pan-Broiled Loin Chops.

## SAVORY SAUCE.

To the fat in the pan in which the chops have been broiled add enough butter to make about two tablespoons. In this brown three tablespoons of flour and add one cup of water or stock. Season with salt and pepper and add one-half onion, finely chopped, and one tablespoon each of capers and finely chopped pickle.

## TOMATO SAUCE.

2 tablespoons butter.	1 stalk celery.
2 tablespoons flour.	1 sliced onion.
Stewed or fresh tomato enough to make 1 cup when well boiled down.	Few cloves.
	Salt and pepper.

Cook the tomatoes with the seasonings. Cook the flour thoroughly in the butter, strain the tomatoes, and add to them the butter and flour. Cook all together until smooth, stirring constantly.

## Montana Steak.

1 pound lean mutton free from bone.	1 teaspoon salt.
1 egg.	$\frac{1}{2}$ teaspoon pepper.
$\frac{1}{2}$ cup milk.	Few drops onion juice.

Chop the meat finely, add the other ingredients, form into small cakes, and either broil or fry them. While this dish is more delicate if the egg and milk are used, it can be made without them. In this case it resembles very closely Hamburg steak as it is ordinarily prepared from beef. It may be made with or without onion.

## FRYING.

Frying in deep fat is a method of cooking meat in which it is subjected to high temperature, and which imparts a distinctive flavor to the meat. It is a common custom to dip meat, fish, etc., cooked by this method, in egg and fine crumbs before immersing in the hot fat.

**Fried Crumbed Mutton.**

If thin pieces of mutton, either raw or cooked, are dipped in flour, then in egg, and then in crumbs and fried in deep fat, they lose less moisture than if broiled or panbroiled. This method is especially suitable for rib chops, thin loin chops, or small pieces cut from rare cooked meat. Thick chops would hardly be cooked through by this process.

**Fried Rib Chops.**

Wipe the chops and salt them on both sides, dip them in flour, and then in a mixture of egg and water in the proportion of one egg to two tablespoons of water and finally in fine cracker crumbs. Fry in deep fat at a temperature suitable for foods that have not been already cooked, which is about 350° F. In fat of this temperature a small piece of bread from the center of the loaf will become a delicate brown in one minute.

Chops prepared in this way are often served around a mound of mashed potatoes. This has the advantage of keeping the chops hot if the precaution has been taken to reheat the potatoes after they have been mashed. A depression may be made in the mound of potatoes for tomato sauce, which is a good accompaniment for this dish. Broiled or fried chops are sometimes served around mounds of peas, young carrots, turnips, fried green peppers, or a purée of beans.

To prepare the carrots for this purpose, boil them in water, pour off the water, and add a little butter, a very little sugar, and chopped parsley. Reheat.

To prepare green sweet peppers, which are an exceptionally good accompaniment for mutton, remove all the seeds, cut into thin slices, and cook in butter and a little water. Allow the water to evaporate after the peppers have become tender and cook them in the fat until they begin to brown, but not long enough to blacken them.

Another dish which is often served with mutton chops or roast mutton is a purée of navy beans.

**Purée of Navy Beans to Accompany Mutton Chops and Roast.**

1 pint beans.	2 tablespoons mutton drippings.
1 onion.	2 cloves.
1 carrot.	$\frac{1}{2}$ teaspoon salt.
1 sprig parsley.	1 quart water.
Pepper.	1 tablespoon butter.
$\frac{1}{2}$ pound salt pork or	

Soak the beans over night, drain, and add the other ingredients with the exception of the butter. Boil for 30 minutes and cook in a moderate oven for one hour. Remove the onions, carrot, and parsley and press through a sieve. Add butter and salt (if necessary) and reheat. Similar purées may be made from red kidney beans, split peas, and lentils.

**WARMED-OVER MUTTON.**

Since the successful recocking of mutton usually consists in utilizing well what happens to be on hand, both in the way of meat and also of vegetables or other accompaniments, it is difficult to give any definite recipes. In many cases the preparation of a dish involves simply the reheating of pieces of the cold meat in a gravy, and for this reason the principles of the making of gravies should be kept in mind in this connection. The proportions for a sauce of suitable thickness are two level tablespoons of fat and two of flour to each cup of liquid. The fat may be butter, drippings, or savory fat, and the liquid may be water, stock, milk, tomato juice, or a combination of two or more of these. Browning the flour in the fat is an easy way of securing variety. If this is done the thickening power of the flour is reduced and the amount used should be three instead of two tablespoons to one cup of liquid.

The following, which is capable of a large number of variations secured by using different fats, liquids, and seasonings, is a good sauce in which to reheat mutton. The possibilities in the way of flavoring by sweet herbs, peppers, pickles, capers, currant jelly, etc., have been suggested from time to time in this bulletin.

#### SAUCE FOR WARMED-OVER MUTTON.

1½ cups white stock.	½ cup butter.
1 slice onion.	½ cup flour.
1 slice carrot.	1 cup scalded milk.
1 sprig parsley.	½ teaspoon salt.
2 peppercorns.	½ teaspoon pepper.

Cook the stock 20 minutes with onion, carrot, bay leaf, parsley, and peppercorn, and strain. There should be one cup. Melt the butter, add the flour, and gradually the hot stock and milk. Season with salt and pepper.

#### Mutton in Gravy.

Cold mutton reheated in gravy or sauce is served with rice, on toast, on baking-powder biscuits, with a pastry or biscuit crust, with a crust of mashed potatoes, or with a crust consisting of mashed potatoes and mashed turnips in proportion of 2 to 1.

#### Cutlets of Cold Mutton.

From a leg of mutton, which has been cooked rare, cut pieces about the size of an ordinary loin chop. These may be fried in a little fat, or egged, crumbed, and fried in deep fat, or they may be brushed over with fat and broiled. The result is like meat cooked for the first time rather than like the ordinary warmed-over meat. Cutlets thus prepared may be served with any of the sauces suggested for serving with chops.

#### Mutton and Tomato Pie.

An excellent way to use cold mutton is to bake it with tomatoes, using alternate layers of tomatoes and meat. A tomato sauce may be used or the following method may be employed: Place in a baking dish a layer of fresh tomatoes or of cooked tomatoes which have been either drained or reduced in volume by boiling. Add a layer of meat, dredge with flour, salt, and pepper, and add small bits of butter until the materials are used, arranging to have a layer of tomatoes on top. Cover this with a layer of buttered bread crumbs or cracker crumbs and bake until the crumbs are brown. In following this method use tomato, butter, and flour in the correct proportions for tomato sauce, i. e., two level tablespoons each of butter and flour for each cup of tomatoes.

#### Green Peppers Stuffed with Mutton.

Cut green peppers in two lengthwise and remove all the seeds. Fill with a mixture of equal parts of cold mutton and boiled rice well seasoned and moistened with a little stock or water. Bake until the peppers are tender.

#### Mutton Croquettes.

Like other meats, mutton may be used for croquettes. A general rule for making croquettes is to combine two cups of finely chopped cooked meat (or the same amount of a mixture of meat, rice, and potatoes, or other vegetables) with one cup of thick sauce. The sauce for this purpose is made by heating one-third cup of flour, or one-fourth cup of cornstarch, in three tablespoons of fat, and adding a cup of liquid which may be stock, water, milk, tomato juice, or a mixture. The amounts given above are those generally used, but the proportion of sauce to meat varies under different circumstances, as some substances absorb more of this sauce than others do. It is a common practice, though by no means necessary, to add the yolk of a raw egg. After

the mixture of meat and sauce is cooled it is formed into rolls of uniform size which should be dipped first in flour, then in a mixture of two tablespoons of water and one egg, and finally in fine cracker crumbs. The temperature for frying croquettes is that for all foods which have already been cooked (about 400° F.). Fat (oil, lard, drippings, etc.) at that temperature will brown a piece of bread taken from the center of a loaf in 40 seconds.

#### Mutton and Caper Croquettes.

3 tablespoons savory fat.	2 cups finely chopped cold mutton.
$\frac{1}{2}$ cup flour.	1 tablespoon finely chopped capers.
1 cup mutton stock or milk.	Salt.

Make a sauce out of the fat, flour, and liquid, mix with the other ingredients, and follow the rules given above for making croquettes.

#### Mutton and Rice Croquettes.

In the above recipe, substitute one cup of cold boiled rice for one of the cups of mutton.

#### Mutton and Potato Croquettes.

In the recipe for mutton croquettes, substitute two-thirds of a cup of cold boiled potatoes cut into small pieces for one of the cups of mutton.

#### Steamed Mutton and Rice.

4 cups cooked or	Few drops onion juice.
1 cup raw rice.	1 tablespoon chopped parsley.
2 cups cooked mutton cut into small pieces.	$\frac{1}{2}$ cup bread crumbs.
1 teaspoon salt.	1 egg.
$\frac{1}{2}$ teaspoon pepper.	Stock or water.

Grease a mold or a bowl of about 1½ quarts capacity and line with cooked rice. Heat the meat with the other ingredients, using enough stock to make a mixture that is moist, but will hold its shape. Pack the meat in the center of the mold and cover with the remaining rice, grease the cover of the mold (if a bowl is used, a plate will serve for a cover), steam or cook in water enough to partly cover the mold until the contents are thoroughly heated through. Turn it on a hot platter and serve with tomato sauce.

The above recipe, it will be noted, suggests the use of bread crumbs instead of flour for thickening, which is often a way of saving bread which might otherwise be wasted, and which is also one way of securing variety, as a different texture results than when flour is used.

#### Mock Venison.

Cut cold mutton into thin slices and reheat in a sauce made in the following way:

2 tablespoons butter.	1 tablespoon catsup or other meat sauce.
2 tablespoons flour.	Salt.
1 cup water or stock.	
$\frac{1}{2}$ cup red currant jelly.	

Make a brown sauce out of the butter, flour, and water or stock. Add the jelly and other flavorings.

#### Turkish Stuffed Tomatoes.

In Turkey a number of dishes are prepared from mutton which are interesting from the point of view of the food customs of another country, and also palatable. The recipes here given have been modified somewhat to accord with our usual habits of cookery. One of them involves the use of broken rice, which can easily be prepared by the use of an ordinary meat grinder. The following recipe for stuffed tomatoes is little different from many used in this country:

Two tablespoons cooked rice, one-half pound raw mutton, two onions. Pass the materials through a meat grinder; season with salt, pepper, and chopped parsley; fry in a pan for 10 minutes, stirring constantly. Wash one dozen smooth round tomatoes, cut a thin slice from the stem end, leaving a little of the skin for a hinge, remove the seeds and pulp, and fill with the meat mixture. Bake in a pan for 20 minutes, lift out with a broad knife and serve hot.

#### Mutton and Eggplant Pie.

Eggplant pie is a simple and well-seasoned dish made from a vegetable which has no marked flavor. It is made by cooking together in a baking pan alternate layers of eggplant and of chopped mutton fried in its own fat. Sometimes a little tomato juice is added or a few sliced tomatoes. It should be baked until well browned.

#### Mutton and Rice Rolls.

A characteristic Turkish dish is "sarma" or rolls made of meat and broken rice wrapped in grape leaves and then boiled. An acceptable substitute for this dish and one more in accord with common methods may be made by cooking chopped mutton and rice in a baking dish lined with slices of tart apple, which gives an even more pronounced tart flavor than the grape leaves, or the following recipe may be used:

#### Mutton and Cabbage-Leaf Rolls.

- |                             |  |                                |
|-----------------------------|--|--------------------------------|
| 1 cup raw chopped mutton.   |  | $\frac{1}{2}$ teaspoon pepper. |
| 2 tablespoons fat.          |  | 1 head cabbage.                |
| $\frac{1}{2}$ cup raw rice. |  | 1 lemon.                       |
| 2 teaspoons salt.           |  |                                |

Throw cabbage leaves of suitable size into boiling water and let them stand until they are wilted. Mix the remaining ingredients (with the exception of the lemon) and form into rolls, each containing about 1 tablespoon. Wrap each roll in a cabbage leaf, removing the thicker part of the stem of the leaf if necessary in order to roll it well. Pack these rolls closely into the baking dish and cover with water or stock. Bake one-half hour. Just before serving squeeze the juice of a lemon over them.

Or serve with the following:

#### SOUR BUTTER SAUCE FOR MUTTON AND CABBAGE-LEAF ROLLS.

- |  |  |   |
|--|--|---|
| 1 tablespoon chopped pickle.                         |  | 3 tablespoons vinegar (spiced vinegar from pickles preferable). |
| 1 tablespoon chopped parsley.                        |  | Salt and red pepper to taste.                                   |
| 2 tablespoons butter.                                |  |   |
| 2 tablespoons mutton fat (savory or plain rendered). |  |   |

Beat the butter and mutton fat with a spoon until smooth, then beat in the vinegar until the sauce looks light colored and the vinegar has all been taken up. Add 1 tablespoon of finely chopped pickles and 1 tablespoon of finely chopped parsley.

#### MUTTON WITH FRUITS.

In the Orient it is a common custom to cook mutton with various fruits. Quinces, pears, apricots, and prunes, either fresh or dried, are used for this purpose. The fruit and meat should be cooked separately and reheated in combination. Some recipes direct that the meat be browned before cooking in water, others that it simply be stewed in water. Of the many recipes that might be given the following, based on oriental recipes, are selected:

#### Mutton with Quinces.

For this recipe use any cut of mutton suitable for stewing and twice its weight of raw quinces. Cut the meat into small pieces and brown them either in mutton fat or butter. Cover with boiling water, add salt, and cook slowly

until tender. Pare and quarter the quinces and cook them in a small amount of water until tender. Combine the meat with the fruit and cook slowly for 10 or 15 minutes. Serve with rice. Variety may be obtained by making a brown gravy with the fat in which the meat is fried (see recipe, p. 23) and cooking the meat in that.

#### Mutton with Sour Apples.

In the above recipe sour apples may be substituted for quinces.

#### Mutton Baked with Apples and Onions.

2 pounds mutton cutlets from neck.	1 onion.
Salt.	4 medium-sized apples.

Prepare the meat by removing the bone and superfluous fat. Season with salt and lay in a baking dish. Cover the meat with finely sliced sour apples and finely chopped onions. Bake in a moderate oven until the meat is tender, which will be about one hour.

#### CORNERD MUTTON AND ITS USES.

The following directions for cornering mutton are a modification of those given in an earlier bulletin of this series.<sup>1</sup> For convenience, the amounts are changed so as to be suitable for the quantity of meat which would usually be used in the home. If larger quantities are cornered, the quantities should be increased proportionately. The shoulder is the cut most frequently cornered. The leg is delicious cornered, but it is too expensive to be used in this way except for the purpose of preserving it.

10 pounds mutton.	1 tablespoon saltpeter.
1½ cups salt.	¾ cup brown sugar.
½ tablespoon baking soda.	

Rub the salt thoroughly into the meat, covering every portion, and allow the meat to stand with the salt on it for 24 hours; then pour over it the other ingredients dissolved in a small amount of lukewarm water. Add water enough to cover the meat, and allow the meat to stand in the brine for at least three or four days. Meat thus cornered will keep in good condition for a long time. Since mutton absorbs salt more readily than beef, special care should be taken to avoid using too much of it.

Cornered mutton may be used in all the ways in which cornered beef is used. The broth in which it is boiled makes good soup when seasoned with onion and turnip or other vegetables.

#### MUTTON SAUSAGES.

Sausage can be made from mutton mixed with pork in much the same way as beef is used for similar purposes. A general formula would be: Mutton, 2 parts; lean fresh pork, 1 part; and fat pork, 1 part; with salt and seasoning to suit the taste. Such sausage can be made into cakes and cooked at once or may be packed in skins or bags in the usual way. Homemade sausage is very commonly kept frozen. When this is not possible, it is often convenient to make small quantities for immediate use.

#### Mutton Sausage No. 1.

1 pound mutton free from bone.	½ teaspoon salt.
½ pound fat fresh pork.	½ teaspoon each, marjoram, thyme,
½ teaspoon black pepper.	and sage.

Put the meat through a sausage or meat grinder, and mix thoroughly with the other ingredients. Pack in a bag about 2½ inches in diameter and keep in a very cool place. Cut into slices and fry. If it is to be used at once packing in

<sup>1</sup> U. S. Dept. Agr., Farmers' Bul. 186.



a bag is not necessary; instead the chopped and seasoned meat may be made into cakes.

#### Mutton Sausage No. 2.

$\frac{1}{2}$ pound mutton free from bone.	$\frac{1}{4}$ teaspoon each, marjoram, thyme,
$\frac{1}{4}$ pound veal.	and sage.
$\frac{1}{4}$ pound salt pork.	$\frac{1}{8}$ teaspoon black pepper.
$\frac{1}{4}$ teaspoon salt.	

In preparing the sausage, follow the directions for Mutton Sausage No. 1.

#### SUMMARY.

Many experimental studies of the relative nutritive value of different kinds and cuts of meat, the losses sustained in cooking meat in different ways, the thoroughness of digestion of meat and the effect on palatability and economy of different methods of preparing it for the table, and similar questions have been studied in connection with the nutrition investigations of this office.

Mutton and lamb have been widely used in many countries since early times as staple foods. In later years lamb has been the more popular of the two in the United States, perhaps because special attention has been given to raising lamb for the market and to extending its season. The whole question is simply one of taste, and mutton in some form or other has always been a staple and a favorite food. That it is wholesome as well is generally believed, and this is borne out by inspection work of the Department of Agriculture, which shows that it is relatively seldom that mutton has to be rejected as unfit for food.

In composition and nutritive value mutton is practically the same as beef, and the average loss of weight in preparing the two kinds of meat for the table is also practically the same.

Buying in quantity is recognized as an economic procedure where the housewife has facilities for storage. There are many cases in which a side of mutton can be economically purchased for home use where a side of beef is too large for such a purpose, which implies an economy in the selection of mutton.

As regards digestibility, there is no practical difference in beef and mutton, both being very thoroughly assimilated. The characteristic flavor of mutton is commonly said to have its origin in the fat. It is generally relished, and may be developed or modified by various methods of cookery to meet the tastes of the family. That mutton fat can be used in the household in many ways has been demonstrated by experiments which have been made with it.

The ways in which mutton can be prepared for the table are very numerous. Some of these are well known to the housewife, and others are less familiar. All are worthy of a trial, since the ability to make many dishes with any given foodstuff is an easy way of securing variety in the diet, which is so desirable. The housewife who wishes to economize can make many savory dishes from the inexpensive cuts of mutton, which are palatable as well as wholesome.

Judged by its composition, palatability, wholesomeness, digestibility, relative cost, and the number of ways in which it can be prepared for the home table, mutton is an important foodstuff, which is well worth the attention of the housekeeper who wishes to provide her family with an attractive and palatable diet at a reasonable cost.